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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/659,490	09/11/00	BREBOL	K 459-482P

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EXAMINER
CUEVAS, P

ART UNIT	PAPER NUMBER
2834	

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	Application No.	**Applicant(s)**
Office Action Summary	09/659,490	BREBOL, KLAUS
	Examiner	**Art Unit**
	Pedro J. Cuevas	2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *20 August 2001* .

2a) ☒ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-9 and 12-24* is/are rejected.

7) ☒ Claim(s) *10 and 11* is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☒ The proposed drawing correction filed on *20 August 2001* is: a) ☒ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3,8* .

18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 1-9 and 12-24 have been considered but are

moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1-9 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over

U.S. Patent No. 5,861,704 to Kitami et al. in view of U.S. Patent No. 3,562,563 to Schafft.

Kitami et al. clearly teaches the construction of a piezoelectric transformer with a primary

portion (13) and a secondary portion (12) as shown in Figure 2, capable of generating and

transforming piezoelectric vibrations in accordance with an AC Voltage fed to one portion.

These piezoelectric portions are annular in shape, polarized perpendicular to the peripheral

direction, adapted to operate at a resonance frequency of a dimension of a cross-section (R) of

the annular body perpendicular to the peripheral direction and where the secondary portion is

provided with a plurality of inner electrodes (6).

However, it fails to disclose an annular, i.e., ring shaped, body.

Schafft clearly teaches the construction of a piezoelectric transformer with a primary

annular portion (11a) and a secondary annular portion (11b), capable of generating and

transforming piezoelectric vibrations in accordance with an AC Voltage fed to one portion for the purpose of providing an improved high voltage transformation device and to increase the power handling capability of a ceramic ring transformer.

It would have been obvious to one skilled in the art at the time the invention was made to use the ring shape transformer disclosed by Schafft on the piezoelectric transformer disclosed by Kitami et al. for the purpose of providing an improved high voltage transformation device and to increase the power handling capability of a ceramic ring transformer.

4.   With regards to claim 2, Schafft discloses a piezoelectric transformer where the annular body is an annular body as shown in Figures 1-3 and 5.

5.   With regards to claim 3, Kitami et al. discloses a piezoelectric transformer where the resonance frequency of a dimension of a cross-section of the annular body perpendicular to the peripheral direction of the annular body is a resonance frequency of the thickness of the annular body.

6.   With regards to claim 4, Kitami et al. discloses a piezoelectric transformer where the primary and the secondary portions of the piezoelectric body have been polarized in the thickness direction of the piezoelectric body.

7.   With regards to claim 5, Kitami et al. discloses a piezoelectric transformer where the primary portion of the piezoelectric body has been radially polarized.

8.   With regards to claim 7, Schafft discloses a piezoelectric transformer where the piezoelectric body is annular with a through-going opening as shown in Figures 1 and 3.

9.   With regards to claim 8, Schafft discloses a piezoelectric transformer where the opening is a through-going opening in the thickness direction of the body as shown in Figure 1.

10.   With regards to claim 9, Schafft discloses a piezoelectric transformer where the annular

piezoelectric body (11) is shaped as a hollow circular cylinder with a circular cylindrical opening

having the same center as the cylindrical body as shown in Figure 3.

11.   With regards to claim 22, Kitami et al. discloses a piezoelectric transformer, which

contains a separate galvanic separation layer (37) between the primary and the secondary

portions as shown in Figure 11.

12.   With regards to claim 23, Kitami et al. discloses a piezoelectric transformer, where the

electrodes of one or both portions of the piezoelectric body are embedded in their respective

portion, and where the piezoelectric material (37) between the portions and the embedded

electrodes, is used as a galvanic separation while still actively participating in the power transfer

as shown in Figure 11.

13.   With regards to claim 24, Kitami et al. discloses a piezoelectric transformer with:

        a piezoelectric body (Fig. 11)

        a primary portion (1) and a secondary portion, both being able to generate and transform

piezoelectric vibrations

        electrodes (6) on one or both portions of the piezoelectric body, embedded in their

respective portion

        a piezoelectric material (37) between the primary and the secondary portion to be used as

a galvanic separator while still actively participating in the power transfer of the device, as

shown in Figure 11.

14.   Claims 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent

No. 5,861,704 to Kitami et al. in view of U.S. Patent No. 3,562,563 to Schafft as applied to

claims 1-9 and 22-24 above, further in view of common knowledge in the art.

Kitami et al. in view of Schafft, discloses the claimed invention except for:

a piezoelectric transformer where the ratio b/h between width b of the wall of the annular

body and the height h of the wall of the annular body (the thickness of the annular body) is at the

most 0.25 for the purpose of maximizing the efficient coupling of the piezoelectric transformers,

a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the

opening of the annular body and the width b of the 30 wall part of the body surrounding the

opening is at least 0.5,

a piezoelectric transformer where the ratio o/b between the transverse dimension o of the

opening of the annular body and the width b of the wall part of the body surrounding the opening

is at least 1,

a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the

opening of the annular body and the width b of the wall part of the body surrounding the opening

is at least 1.5,

a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the

opening of the annular body and the width b of the wall part of the body surrounding the opening

is at least 2,

a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the

opening of the annular body and the width b of the wall part of the body surrounding the opening

is at least 3, and

a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to:

select the ratio b/h between width b of the wall of the annular body and the height h of the wall of the annular body (the thickness of the annular body) of a piezoelectric transformer to be at the most 0.25 for the purpose of maximizing the efficient coupling of the piezoelectric transformers,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 0.5,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 1,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 1.5,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 2,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 3, and

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 5;

since it has been held that discovering an optimum value of a result effective variable

involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

15.   With regards to claim 13, Kitami et al. in view of Schafft, discloses the claimed invention

except for:

a piezoelectric transformer, where the ratio b/h is between 0.35 and 0.8,

a piezoelectric transformer, where the ratio b/h is between 0.4 and 0.7, and

a piezoelectric transformer, where the ratio o/b between the transverse dimension o of the

opening of the annular body and the width b of the wall part of the body surrounding the opening

is in the interval of 1-5.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to:

select the ratio b/h is between 0.35 and 0.8,

select the ratio b/h to be between 0.4 and 0.7, and

select the ratio o/b between the transverse dimension o of the opening of the annular body

and the width b of the wall part of the body surrounding the opening to be in the interval of 1-5;

since it has been held that where the general conditions of a claim are disclosed in the

prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re

Aller,* 105 USPQ 233.

Allowable Subject Matter

16.   Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims.

Conclusion

17.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure: See PTO-892.

18.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

        A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

19.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The

examiner can normally be reached on M-F from 8:30 - 6:00.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Néstor R. Ramírez can be reached on (703) 308-1371. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 305-1341 for regular

communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 308-0956.

pjc
November 5, 2001